

The National Geographic Magazine

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WASHINGTON

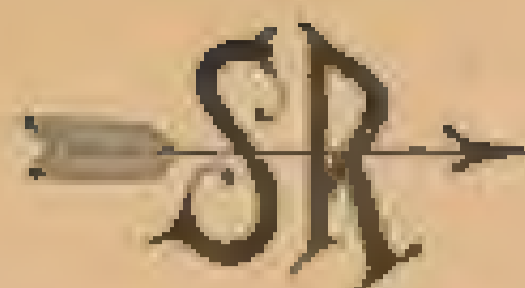
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OLD LAND ICEBERG — JAIL ROCK, SHERBROOK COUNTY, NEBRASKA

THE National Geographic Magazine

VOL. X

SEPTEMBER, 1890

No. 9

THE COMMERCIAL DEVELOPMENT OF JAPAN

By D. P. AUSTIN,

Chief of the Bureau of Statistics, Treasury Department

With new currency, a new tariff, new relations to her foreign population, and new treaty relations with the commercial world, Japan's commercial future is a subject which naturally arrests attention and also arouses much conjecture; and when it is considered that the trade relations of that country with the United States are growing more rapidly than those with any other nation, the subject becomes one of especial interest to the people of the United States. Our exports of merchandise to Japan, which 20 years ago were but a couple of millions of dollars annually, had reached five millions by 1880, nearly eight millions in 1890, over 13 millions in 1897, 20 millions in 1898, and between 17 and 18 millions in 1899. Our purchases from Japan of articles which we must have, such as raw silk and fibers for our manufacturers, tea, rice, and other articles which we cannot produce at home, have constantly grown, even while our purchases from other parts of the world were being reduced, and are now from 25 to 26 millions a year, against one-half that sum fifteen years ago. Over a thousand citizens of the United States are now residing in Japan, many of them actively participating in her foreign commerce, two-thirds of which is still conducted by foreigners, while over seven thousand citizens of Japan are residing in the United States, many of them as students, and over twenty-seven thousand of her people are residents of the Hawaiian islands, which are now under the United States flag. No European nation except Great Britain has so many citizens residing

in Japan as has the United States, and no country has as many Japanese citizens under her flag as has our own, while no nation is so closely associated with the growth of her commerce or has greater reason to expect an active participation in it.

Japan has during the past few years assumed an important rank in the list of commercial nations, and in doing so has vastly increased her commerce with the United States, the nation instrumental in first opening the doors of that country to commerce with the world. Within the last two years new treaties have been made with the principal countries of the world, by which their citizens are given equal privileges with the citizens of Japan in all parts of the empire and made subject to its laws, which have been recently revised. Also new commercial codes have been established, new currency adopted, new tariffs created, and new ports opened for commercial intercourse with the world. Lastly, Japan and the United States have become near neighbors physically, Japan's northern territory, the Kurile islands, lying within 500 miles of the Aleutian islands, while her southern extreme, Formosa, is within 200 miles of the Philippines, thus making a complete chain along the Pacific front of Asia. From Yokohama, her most important port of entry, the distance to Manila as a trade center is practically the same as that to Hongkong, which has proved so important a distributing point for British trade. From Yokohama to Honolulu, a distance of 3,400 miles, Japanese steamships now regularly ply, and from Yokohama to the Pacific coast ports of the United States the distance is far less than to the ports of any other great commercial nation, while the opening of an isthmian canal would greatly lessen the water route between Japan and the Gulf and Atlantic ports of the United States, from which she draws so large and constantly increasing a proportion of her supplies.

To the readers of *THE NATIONAL GEOGRAPHIC MAGAZINE* the earlier commercial relations of Japan to the world and the part which the United States has had in developing them are so well known that they need not be recounted in detail. Portuguese adventurers, who were the first to establish commercial relations in China, soon extended their trade to Japan, where sailors landed in 1542 and within a few years established an active commerce. Encouraged by that success, the Dutch East India Company in 1598 dispatched five merchant vessels to Japan. In 1600 other Dutch ships arrived and were well received by the Japanese, who conceded them a port on the island of Hirado

and the privilege of establishing a "factory" or trading post and settlement. The hostilities between the Portuguese and Dutch, however, and the extreme demands of the Portuguese, who considered themselves already established in the commerce of Japan, coupled with dissatisfaction with the attitude of foreign missionaries toward the popular religion of Japan, led to the exclusion of all traders except the Dutch, who were permitted to take up their residence on a small island, Deshima. Here they remained for more than two centuries in undisturbed monopoly of the entire European trade of Japan. In 1852 serious complaints of mistreatment of American sailors wrecked on the coast of Japan having been made, Commodore M. C. Perry, with a fleet of American vessels, was sent by the United States government to demand from Japan a treaty by which American vessels should be allowed to enter one or more of its ports to obtain supplies, and, if practicable, that Americans should also be given general trading privileges in these ports. This undertaking was peacefully carried to a successful termination, a treaty being signed March 31, 1854, by which the ports of Shimoda and Hakodate were opened as harbors of refuge, supply, trade, and consular residence to the United States. This action was quickly followed by a successful demand for similar privileges by the British, Russian, and Dutch governments, and by 1860 the ports of Hakodate, Kanagawa, Nagasaki, and Nōgata were opened to the commerce of the leading nations of the world.

From this time forward the commercial relations of Japan with the world made rapid progress. In 1860 and 1861 a Japanese embassy visited the United States and Europe. The decade 1860-70, while largely occupied by dissensions, and in some cases hostilities, between the elements favoring commercial relations with the world and those preferring former methods, saw marked developments within Japan, the beginning of the adoption of the customs and methods of western nations, and laid the foundation of the progress which has since been made. In 1871 another embassy, consisting of the ambassador and junior prime minister, Iwakura, the vice-ambassador, Kido, Count Ito Hirobumi, the three ministers of the cabinet, and several officers, sailed from Japan to visit all the nations having treaties with that country.

The development of Japan which followed these tours of observation and intercourse with other nations of the world was very rapid. Schools were increased, students were sent abroad to obtain a higher education and study foreign methods, internal

highways made, steamships built and communication with foreign countries increased, manufacturing industries encouraged and multiplied, and business men from other countries welcomed to participate in the commercial and business development of the country. As a consequence, the foreign commerce of Japan, which in 1878 amounted to less than \$30,000,000, in 1898 was over \$218,000,000, while the development of railroads, manufactures, and internal industries had been equally great.

The United States, which has been constantly and actively associated with the development of Japan, has participated largely in the growth of her commerce. Thousands of young men from Japan have visited the United States as students, and thousands of merchants and business men from the United States have gone to Japan as instructors both in educational and commercial lines. As teachers and professors in schools and colleges, as editors and publishers, as merchants who engage in both importing and exporting, as manufacturers, as constructors of railways and telegraphs and in establishing modern electrical aids to commerce, citizens of the United States have been active in Japan. As a consequence, the trade relations between the two countries have grown with greater rapidity than between Japan and any other nation. In 1881 the imports from the United States formed less than 3 per cent of the total importations into Japan, while in 1898 they formed 15 per cent of the total importations. Meantime Great Britain's share in the imports of Japan fell from 52 per cent in 1881 to 23 per cent in 1898. The United States is also Japan's largest customer by reason of the fact that the chief export products of Japan are articles required by the manufacturers of the United States and cannot be produced in this country.

Of the \$21,500,000 total exportations to the United States in 1898, the value of \$12,620,000 consisted of raw silk, \$1,286,000 of tea, \$1,847,000 of mats for floors, \$347,000 of rice, \$336,000 of chemicals, drugs, etc., and \$3,199,000 of manufactures of silk, while Japanese foot-mats, manufactures of bamboo, lacquered ware, and other products peculiar to the Japanese are prominent in the list. Exports from Japan to the United States have steadily grown, especially since the development of the silk manufacturing industry in this country. The United States is the largest purchaser of raw silk from Japan, whose total exportations of raw silk exceed \$28,000,000. France is the next largest customer in this line, her purchases of raw silk from Japan in 1897

amounting to \$10,000,000 in value against \$18,000,000 by the United States. The exports from Japan to the United States in 1881 were \$5,500,000 in value, being 56.5 per cent of the total exports of that year, and in 1898 were \$23,500,000, or 29.96 per cent of the total exports of that year.

Japan's imports from the United States have grown with even greater rapidity than her exports to the United States. In 1881 they amounted to but \$800,000, and in 1898 had reached \$20,000,000 in value. They have increased even more rapidly than the total importations of Japan, our share of her import trade having risen from 3.72 per cent in 1881 to 14.57 per cent in 1898, while the United Kingdom, our principal competitor in that market, which furnished in 1881 52.51 per cent of the total imports of Japan, supplied in 1898 22.84 per cent. In the fiscal year 1892 our total exports of domestic merchandise to Japan amounted to \$3,288,282, and in 1899 to \$17,158,970. Of this total of \$17,158,970 exported to Japan in the fiscal year just ended, the largest item was raw cotton, which amounted to \$5,775,784 in value; the next largest was tobacco and manufactures thereof, amounting to \$2,927,700, then followed iron and steel and manufactures thereof, \$2,578,613; illuminating oil, \$2,241,922; broad-stuffs, \$744,532; wood and manufactures thereof, \$520,694; distilled spirits, \$414,404; paper and manufactures of, \$356,118; instruments for scientific purposes, \$232,000; provisions, \$212,408; leather and manufactures of, \$209,611; clocks and watches, \$137,307; paraffine wax, \$132,273; lubricating oil, \$119,553; chemicals, drugs, and dyes, \$80,498; condensed milk, \$76,701, and India-rubber manufactures, \$57,379.

Taking up the great class of iron and steel and examining it in detail, we find that the exports of locomotive engines in 1899 amounted to \$323,514; builders' hardware, \$26,498; sewing machines, \$5,270; car wheels, \$3,624; firearms, \$38,306; machinery not separately specified, \$562,611, and iron and steel not separately specified, \$1,405,715.

A detailed study of the exports from the United States to Japan with the purpose of determining the articles most in demand in that country during the decade, and in which the export trade has most rapidly grown, shows that the largest item is raw cotton, the value of which exported in 1880 amounted to but \$85,211, had grown to \$7,435,526 by 1898, and was \$5,775,784 in 1899, the imports of 1898 having been somewhat excessive. Leaf tobacco,

which was exported in such small quantities prior to 1894 that it found no separate statement in the official accounts, amounted in 1894 to \$829, in 1897 to \$35,124, and in 1899 to \$2,414,482. Cigarettes amounted in 1890 to \$76,556, in 1894 to \$137,805, and in 1899 to \$445,263. Illuminating oil, which in 1890 amounted to \$9,559,395 in value, was in 1899 \$2,341,972. This reduction is due in part to the active competition by Russian and Siametan petroleum and in a small degree to the fact that Japan is now producing some petroleum from her own wells, though a recently published statement indicates that the product is small and the cost of producing practically as great as importing from other countries. It is proper to add, however, that the reduction indicated by the figures quoted is more apparent than real, and is partially due to a reduction in price per gallon, the total exports of illuminating oil to Japan in the fiscal year 1899 being 32,705,180 gallons, against 37,892,960 gallons in 1890. Flour has increased from \$127,420 in 1890 to \$722,710 in 1899. This increase is evidently due to a growing disposition among the Japanese to consume more of this class of food rather than rely as largely upon rice as in former years, since the number of foreigners in Japan, other than Chinese and Koreans, amounts to but about 5,000, and has not materially increased during the period in which our exports of flour to that country have more than quadrupled.

The growth of the importations of tobacco into Japan has been phenomenal. In 1892 the total importation of tobacco, leaf and cut, was valued at \$40,000; in 1896 it was \$74,000; in 1897, \$212,000, and in 1898, \$2,350,000, this extraordinary importation of 1898 being due in part to the increased rate of duty provided by the new tariff; but the fact that in 1897 it was three times as much as in the preceding year would indicate a rapid growth in the demand for tobacco. An examination of the table of exports of tobacco from the United States shows that the markets of this country benefit by practically all of this increase, the exportations of tobacco from the United States to Japan in the fiscal year 1899 being \$2,927,700 in value, as against \$671,272 in the preceding year, prior to which time there had been a steady growth in the exports of tobacco from the United States to Japan.

In paper and its manufactures the export trade to Japan has grown very rapidly, the total exports of this class being, in 1890, \$1,606; in 1896, \$10,126, and in 1899, \$350,118. Instruments for scientific purposes increased from \$9,441 in 1890 to \$34,800

of which the exports only began to be separately tabulated in 1862, amounted in that year to £555, and in 1864 to £73,315, in 1886 to £127,841, and in 1889 to £132,213. Cottons, dress goods, increased from £33,000 in 1862 to £80,405 in 1889, manufactures of indigo and other increased from £22,841 in 1862 to £77,377 in 1889. In the same period camellia seed increased from £11,412 in 1862 to £10,750 in 1889, and lard, salted or pickled from 86,846 to £12,801. Leather and its manufactures find a steady demand in Japan, owing to the fact that the number of outdoor shoes of various kinds and styles are used for this purpose is continually increasing. The total number of outdoor shoes given to the last census was 1,188,762, or 20.2 for each 1,000 of the population, and a population of 35,000,000 according to the latest reports of the Department of Agriculture the number of cattle is 4,488,000, or about 130 for each 1,000 of the population.

Exportations of cotton cloth from Japan have fallen by reason of the rapid increase in the manufacture of cotton cloth in that country, amounting for 1889 being but \$2,085,000, or \$141.14 in 1885. Meanwhile, however, exportations of cotton were from Japan have rapidly increased, being in a recent year, \$6,773,784 in 1891, or more \$80,211 in 1889. This is largely due to the increased demand in America of cotton goods from Japan, though American cotton has grown in popularity with the manufacturers there within the past few years. The evidence has shown that cotton from the United States is more satisfactory for use in manufacturing than that which they had been accustomed to obtain from China and India, the standard American cotton being superior to the giving better results. As a consequence, imports of American cotton now form a much larger percentage of the total importation into Japan than in earlier years, although the cottons of China and India have large trade advantages both in the matter of proximity and cheapness of transport and a better production. Japan also grows a considerable amount of cotton of her own, though it can scarcely

keep pace with the growth of her cotton manufacturing industry.

The entire area of Japan is but 109,143 square miles, or less than the state of California, which but about 10 per cent of her land is under cultivation and has a comparatively small population of only 35,000,000, making her a very busy land and shores

not in a large proportion of her area. It must be remembered that Japan with a mere 140,000 square miles is a power of more or about 47,000,000, and must, therefore, devote most of her available land to the production of food for a whole very material population of 47,000,000 and she has to be content with a crop of cotton which is very likely to be replaced by cotton, wheat and other crops, especially rice, which are more comparatively a more successful crop in this country than cotton in Japan has, however, grown very rapidly, the total number of spindles in 1890 being 43,08,702 against 64,08,000 in 1894 and 1,00,000 in 1895. It is thus apparent that Japan was not able to produce for other parts of the world in the proportion of the raw cotton which her rapidly growing cotton lands were capable of, and as the cotton in the United States has a ready-made rapid new way against that from the nearest sources of supply, it is reasonable to assume that the market for American cotton will be a most growing, especially if a market is opened up for cotton by the United States.

The cotton which is now being raised in the United States is not upon the land which was formerly devoted to the cultivation of cotton and which the Japanese have grown very rapidly. It is a point that the demand for raw cotton is of the kind which can cause to increase with great rapidity.

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that the market demand for manufactures of various kinds will be satisfied to some extent by local production and manufacture.

One important factor limiting the export expansion of Japanese manufactures in Japan, looking for a comparison with other countries which have for very long had this market, is that cost factor. As Peckoff writes a great many rates of wages in Japan have very much increased in the last few years and are likely to continue to increase, and that the fear formerly expressed of a combination of a severe annual deflation and a reduction in the value of the Japanese yen will result in driving the manufacturers of other parts of the world out of the markets that for some time seem to have been justified by the experiment. An interesting illustration of this statement is seen in the importations of electric irons and hair brushes. The opinion was expressed a few years ago that the overness of Japanese workmen in reducing the prices of electric washing machines brought to their notice that goods would soon reduce to a minimum the importation of electric irons and hair brushes of this character. Experience, however, has not justified this belief. The importation of electric irons from Japan increased from 130,000 in 1925 to 1,000,000 in 1932 to 1,500,000 in 1938.

The effect of a new tariff law on the Japanese at the end of 1938 in Japan was extremely important. It can be said to be agreed that the Japanese economy in general, as shown by the fact that in 1938 foreign merchandise exports amounted to a value of the value exports of \$81,175,000, and imports of \$150,000,000, the total exports, which have increased at least to \$207,500,000 in current value, of the same foreign merchandise of Japan in 1938, when the value to \$21,500,000, \$11,450,000, or about 50 per cent, was imported by foreigners. At the same time the value of Japanese goods generally has been some 20 per cent of the value of the new relations which will put together the Japanese economy with the rest of the world. The economy is now the result of a change from a system to which they have always been subjected and to a new system of a new system of a new system which the new system is a new system.



THE BAD LANDS OF SOUTH DAKOTA

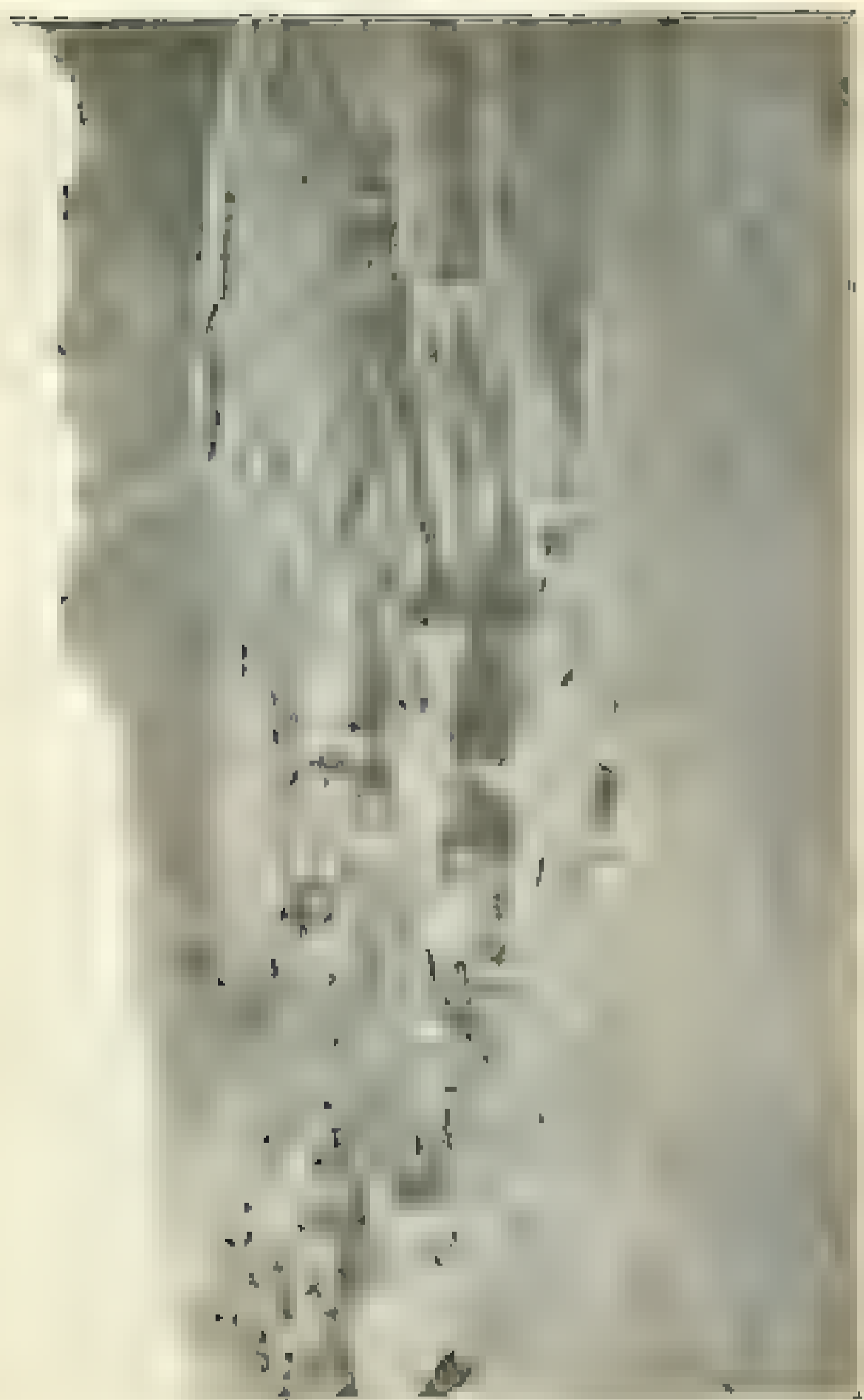
by N. H. DANTON.

U. S. Geological Survey.

There are bad lands of greater or less area in various portions of the world and several districts of the west. The most extensive tract is in the southwestern part of South Dakota, and White River occupies a station east of the Black Hills. They begin near the foot of the hills and extend for about 120 miles up the White River valley nearly to the Nebraska line. Their width varies from 10 to 100 miles and the total area is about 4000 square miles. They attain their latest development on the north side of the valley, a very short distance between White river and the south fork of the Cheyenne river. The surface is high and barrowed, and is composed of the light colored layers of the White River formation—and is a region of slight erosion.

The principal factors in the development here are massive steepness of the moderately hard clay and the steep descent which together afford exceedingly favorable conditions for wind erosion. Somewhat similar conditions prevail on the north side of the White River valley. The region was originally a nearly smooth plain. It was uplifted as a recent geological time, and as the White river and the south fork of the Cheyenne river deepened their valleys during the progress of this uplift, they and their branch streams cut deep gorges to the surface of the plain. As erosion progressed, portions of its surface have been sculptured into narrow ridges, steep-sided buttes, rounded domes, mesas, and castellated forms of endless variety. Portions of the plains remain as grass-covered benches, usually bounded by high, rugged cliffs of clay, and steeply ascending by intricate winding cañons. As erosion is more rapid than soil formation, the alluvium here and the prevalent *serotina* are desert plants, such as greasewood, sagebrush, and willow. The material is fairly homogeneous in its texture, but owing to slight differences in texture, it is carved and channeled into great variety of forms. Occasionally dolerites of granitic and basaltic highly barrowed clay and to the complexity of erosion in prospects. The lower beds of the formation are filled with thin vertical veins of chert and pyrite.





THE FIRST IN A SERIES OF 14

from several points about the head of the Chicago and North
railway black bluffs occur. If a spring could be
obtained, the transportation was increasing with the
land, and the prospect of a coal field was not far off. The
Western railway, as so much has been said, is the North-
western railway, as so much has been said. At the station on the
road, there is a fine view of the black bluffs, and the
black bluffs are not far from the head of the Chicago and
North railway, and the black bluffs are not far from the head
of the Chicago and North railway, and the black bluffs are not
far from the head of the Chicago and North railway.

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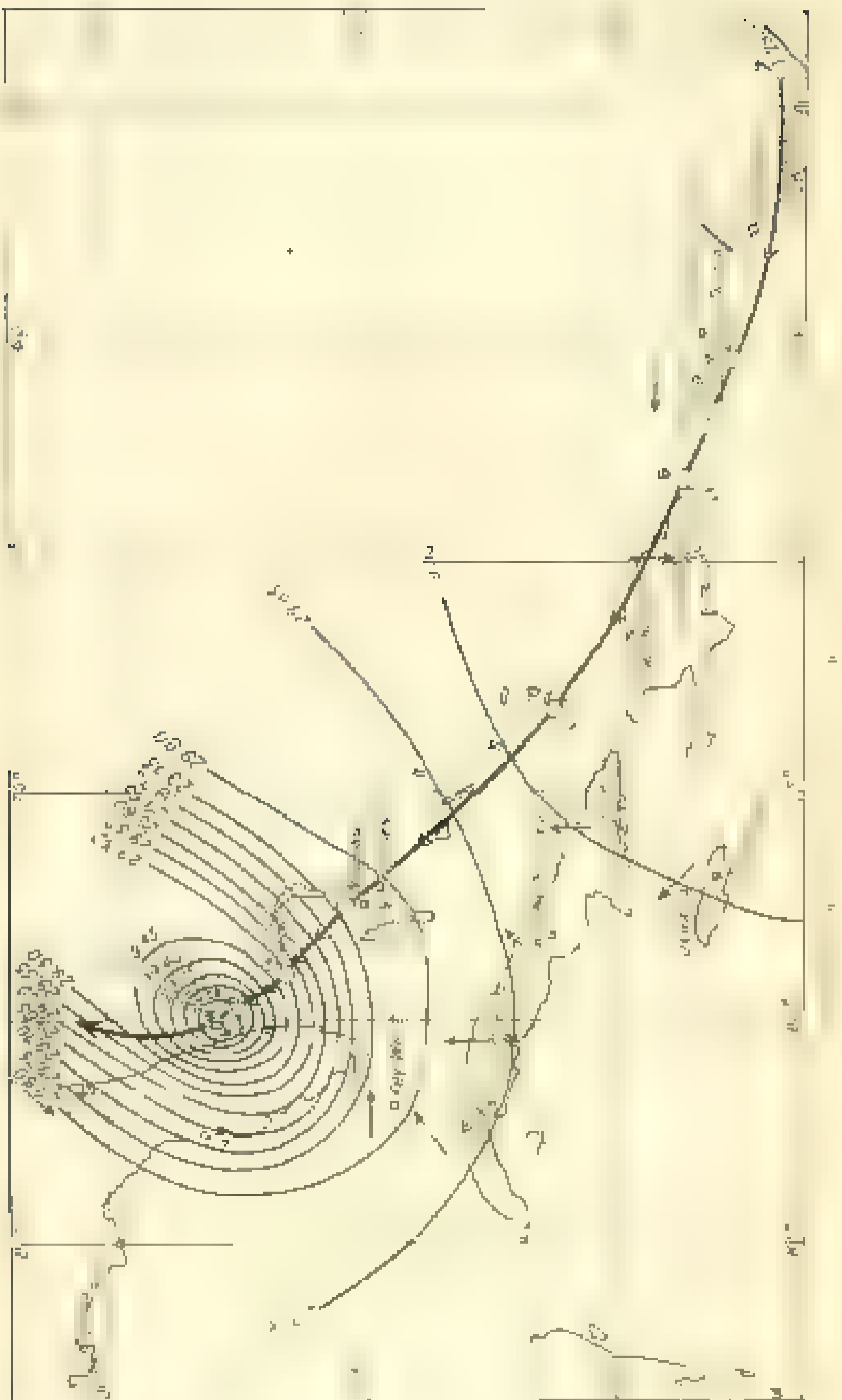
THE WEST INDIAN DECADE OF AUGUST 14, 1890

1947-1948

1. *Principles of Mathematics* by David Hilbert, 1903.

The American public, outside of a peculiar abnost in the West, has an ignorance of August 14, 1846. If a disaster may be particularly attributed to the fact that for the first time in history the United States possessed territory in the far west, was destroyed and had temporarily as a result a reduction of its military power, it is certainly at the storm which on that particular day demonstrated the utility of the newly organized West India branch of the United States Weather Bureau. The existence of Puerto Rico, its vulnerability of special interest and importance for the reason that she possessed the advantage of a full reporting station of the Weather Bureau from which warnings of the approach of the hurricane were disseminated the day before its arrival and where accurate observations of path of the center of the disturbance were recorded.

Extending nearly four miles, on the eastern shore of the port from
Lower Kings to the Lower reaches of the Inner Harbour. To



Sancti Spiritus suffered severely, and on the coast of St. Peter nearly 100 persons were reported killed and villages and estates were destroyed. On the island of Nevis, St. Christopher, and Antigua the storm was less severe, while the Dutch island of Curacao was the only one of the Virgin islands which suffered to any great extent.

Between 8 and 9 a. m. of August 8 the hurricane center passed

which had reached a position near the north coast of Santo Domingo. Following a west-northwest track, the hurricane

Grand Turk island during the night of the 8th. The position

station of observation at Santiago and Puerto Principe, Cuba,

morning of the 11th there was evidence at Newau of the approach of the storm-center. During the day the thermometer

at Jupiter, Fla., was lost. On the following day, August 12,

gale from the northeast, and by the morning of the 13th the

had reached a velocity of 52 miles an hour. From the 11th to the 13th the storm-center drifted slightly upward and north-easterly along the Atlantic coast, attended by severe gales and

passed eastward over the coast beyond the region of San Juan, Puerto Rico.

With data now available it is not possible to determine the intensity of this hurricane at various points along its course. During August 7 and 8 the character and extent of the weather

the Leeward islands, Puerto Rico, and San o Domingo. During this period it was supposed to be advancing from San o Domingo the Bahama islands and thence northward off the coast of the United States, no observations have been received which show the exact strength of the storm as measured by instruments at different points. Observations of the character, made

to adopt steps which would do more to harmonize the farm community and more exchange of property. In the case of disaster at any one time, the fact that the history of this community is completed the case of the cause and effect will aggregate the best results of history. Yes, the first and worth of property.

During the last 7 years, I devoted labor in Puerto Rico to the people of the United States, and to the fact that the United States is not only the oppressor, but also the one who reports on the war. I read the children and the parents of the children of the war, and hear the mother, and the father, and the children's characteristics were not to be confused with the data collected in the past.

the Weather Bureau office at San Juan. At San Juan the barometer began to fall at 1 p. m. of the 7th, and the lowest recorded run—viz 29.23 inches, was reached at 8.40 a. m. of the 8th. The wind was variable, with occasional gusts during the night of the 7th-8th, and gradually settled into a gale from the northeast toward the morning of the 8th. The hurricane was at its height at San Juan between 7 and 11 a. m. of the 8th, when

at 65 to 80 miles an hour. The observer reports that procedure is

lightning and they were not severe, being cleared by him. The rainfall was very heavy, a total of 8 1/2 inches falling, of which 4 1/2 inches fell from noon to 8 p. m. of the 8th. Ponce and the port of Ponce on the south coast were wrecked, with a loss of about two hundred vessels and negroable property for at least \$200,000. The most material damage to property throughout the island is in the mudans of the cane. Two crops were destroyed and crops were ruined and the main body of the working population was left without employment on the latter states, their labor government for the present is closed.

In conclusion, it was proper to refer to the action taken by the United States Weather Bureau in giving warning along the coast as evidence of the approach of the hurricane. In the strategy upon the receipt of the morning reports of Aug. 27, when the storm was central east of Cape Hatteras, the central flow of the West of Louisiana. Weathermen ordered Long Beach data taken, hurricane signals from 10 minutes to Puerto Rico signals were carried to 10 to 10 miles the afternoon of the 27th.

at the expense of the hurricane were sent to all Weather Bureau stations in the West Indies from Barbados to Cuba; and as the

without possible dissemination. In fact, the warnings forewarned

about 1000 islands 10 to 40 and 45 hours of time along the

value is a very acknowledged by owners and masters of vessels who by holding their vessels in port avoided a hurricane which, by the violence of damages and reports of disasters, was one of exceptional violence.

THE RETURN OF WELLMAN

By J. HOWARD LORRE,

Professor of Mathematics and Astronomy in the Johns Hopkins University

In the short article that appeared in THE NATIONAL GEOGRAPHIC MAGAZINE for July, I mentioned three obstacles that to reach the ultimate north. From the meager accounts that

were encountered a high latitude was not reached last year,

the point of debarkation and only two members of the party

and yet the

were made in the neighborhood of Greenland and possibly the means that the four or five islands already known were more accurately located and perhaps better delineated. It is

such a series of observations might yield an accurate return for the outlay of capital, labor and suffering.





to the intelligent theorist, and to the practical meteorologist, and to the general public. The first of these is the report which it is expected to see before the end of the present year. While it is not proper for us to give any detailed account of the results, it may be interesting to have presented to THE NATIONAL TRAVELER a brief synopsis of the scope of the report now under preparation by the writer.

The observations are divided into two classes: (1) The primary, which are made by means of two theodolites placed in the center of the station. These give the absolute heights, velocities, and direction of motion of individual clouds between 6000 and 7000 feet. Observations were made at Washington, D. C. (2) The secondary, executed with nepheloscopes at fourteen stations distributed at

the Rocky mountains, give the relative velocities and direction of motion, with the help of the results obtained by the primary system can be translated into absolute values; there were 25,000 to 30,000 of these observations made in the United States.

A discussion of these data has been divided into a number of parts, of which the following may be mentioned in this connection: (1) The distribution of the cirrus, cirro-stratus, cirro-mollis, alto-cumulus, alto-stratus, stratus, nimbus, cumulo-nimbus, cumulo-stratus, was so determined that we

now know the average height of each type for every month in the year and the center of the normal or binomial bell in which they may severally occur. That the upper types are found to average as much as 3000 miles thick, though they are almost

thinner, and have some peculiar characteristics besides. When

from month to month, indicates some very definite physical

easy to see that they become the best means for studying the

areas of pressure as they move over this country. These movements have been separated into two components, the first be-

which is about eastward in the latitudes, and the second to the

descending and ascending volumes of air. These are given us for the first time with information regarding storm development, and these enable us to look into the theories much more closely than heretofore. 3. This analysis has been applied

to the cyclones of the 1900-1901 season as derived from the Weather

Report of which is to show how the average and extreme areas

parts of the United States—that is, by the Rocky mountains, the Lake region, the Gulf of Mexico, and the Atlantic States—the results being explained in a series of colored charts.

and studies in order to account for them, and thus again to several other lines of research: 1) The first thing was to prepare

study of the papers of several authors, and by the addition of new demonstrations as seemed desirable, so that the work of many men in that several branches may be read as one.

like the earth. (2) Next, a completely new set of working

hydrostatic reductions from one level to another, of density of atmosphere, and vapour tension at the level where a cyclone exists

according to the observed values. These tables are prepared

that it is necessary to know g and that they are needed is seen from the following consideration. The mathematical model and the International Tables are calculated for a model of atmosphere extending to 2000 meters or less to the ground, but in actual work it is necessary to extend it well through to a region up to 15,000 meters in height, with ranges of temperature from $+30^{\circ}$ to -100° centigrade, which is far beyond the limits of any existing tables. The Hertz equation for absolute expansion leaves out the variation of density of the air in parts of the formula, introduces errors as much as 6.0% per cent pressure. Besides, it is not exact at the absolute zero with surface as a base and adapts upward to exact agreement, the elements existing in each column. Also the gradient is not according to level with another.

Since the atmosphere differs very widely from the model of laws, one of our problems is to know how much this difference is for any season of the year, and from these data we expect to apply finally the laws of the atmosphere in an terrestrial calculation—that is, to the meteorology of the atmosphere, here—yours and this work is improved in order. Finally, there are no tables of the elements of variables of computing the elements of the atmosphere.

Related to the problems, and it is necessary if nature may be known in exact science. It is a measurement of the atmosphere in a terrestrial sense, or any other way the terrestriality of the actual value, and the terrestriality of the same, which is the first condition and to show that they are with only a small error of values and do not concern to the stream lines given by the observations. An attempt has been made to interpret the network of equations of motion, so that they should fit the observed facts, and this leads to a different idea of the circulation in storm is from that commonly taught by meteorologists. The application of the theory to tornadoes is certainly satisfactory, and in the case of hurricanes and cyclones it is in the most satisfactory manner.

The new treaty between the United States and Japan went into effect on July 17. The main feature of the treaty is the recognition of the jurisdiction of the United States in respect to the Japanese. Henceforth and the exceptional privileges, except in cases and in no other formerly enjoyed by citizens of the United States as a part of or appurtenant to such jurisdiction, will absolutely cease and such jurisdiction will be assumed and exercised by Japanese courts.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

The forty-seventh annual meeting of the American Association for the Advancement of Science was held in Cambridge, August 19-26. While not only not attended by as large numbers as was the place corresponding to the same time, preceding year, the work accomplished yielded ever better results, as the more excellent organization and increased number of papers read permitted the free discussion of nearly every subject presented for purpose and work of the Association, and at the same time the achievements of modern science, are admirably reviewed in the following paragraphs from the opening address of the distinguished President, Dr. Edward C.

Bradford Washburn has recently made a careful survey of the present state of which the progress of the race is rapidly being made. He describes the two groups, the first embracing the space between what we call the human period to the present century, and the second taking in the discoveries and advances of equal value to us have been made up to the nineteenth century. In the first half he finds but fifteen to be of the highest rank and importance. The second half contains a separate part and beyond question. They may not really be of equal rank and importance. The two parts are not yet fully known, but alphabetical writing and Arabic notation, which have always been the two great engines of knowledge and discovery. The first two are unknown, but the second is brought of probability.

Following after a vast interval in the sixteenth century, A. D., 1500, of the new era's beginning, and in the fifteenth century the press, both of which, beyond question are of the same character and rank as a phenomena writing. From the sixteenth century we get no physical invention or discovery, but it is followed by an amazing movement in the mind, which in general gave rise to the great catalogue of advances of the seventeenth century, the most prodigious of all the centuries ascribed to our own. To it we owe the invention of the telescope and though not of equal rank, the barometer and thermometer and still greater the invention of the differential calculus, the

laws of planetary motion, of the circulation of the blood, of the measurement of the velocity of light. To the eighteenth

century and electrical science. The nineteenth century

has and makes a total of fifteen.

"In making such a list it is evident that the personal equation of the author and notably needs to be recognized, and different lists of arrangement, even if the elements were the same, would be assigned by different students. At any rate, something like this is the list of what the race has gained since science first came to itself up to the year 1800. The greatest steps have certainly been recorded.

And now what has the record been since 1800? How does

progress is not to be compared with a bygone century, but rather with all past time. In fact, it far outweighs the entire progress of the race from the beginning up to 1800. Counting on

fifteen or sixteen already enumerated of all the past. This is

very much a few of them.

"Of the same rank with Newton's theory of gravitation, which comes from the seventeenth century, stands out the doctrine of the correlation and conservation of forces of our own century.

That of the man of man and yet machine. Against Kepler's laws

a myriad of suns scattered through the boundless fields of space,

and the rate in which each is moving. Harvey's immortal dis-

pass of the fourteenth century may give the first place to the electric telegraph of the nineteenth, while the barometer and thermometer of the seventeenth century are certainly as-

tronomical and photographic of our own day.

"I need not pursue the comparison extensively, but to add that the science now enumerated the great doctrine of

theory in embryology, thus nothing to match with it a broadening and deepening power in the past history of the race. The same can be said of the periodic law of Mendeleeff in chemistry, of the molecular theory of gases, of Lord Kelvin's vortex theory of matter, of the glacial period in geology, and of

own century. Nothing can be brought from the past to com-

will grow to the last syllable of recorded time. In the matter

"There are, however, three inventions and discoveries that we

from the darkness of the middle ages, which have proved so

for even the nineteenth century to present anything that can be

perhaps, language and the use of fire. The factors I have

necessities of the case they must have preceded the progress at which we have glided.

"As I have already said, the nineteenth century is the century of science, and it is science, mainly physical science, that constitutes the proper object of this association. Our geographical association is wide, but the scope of our association is wider still. It deals with anything devoted to science, whatever the best product of the best powers of the human mind—the human mind, cre-

THE LITERATURE EXHIBITION

was official reviewer. The association marks two stages already reached, the first stage is a fact, but in its very title it implies that the work is not done, but is still in progress.

"It is forty or fifty years ago, clearly seen that they were in the early morning of a growing day. The great discoveries and inventions progress has made us to see that quite, but as yet there is no occasion and no prospect of an occasion to modify the title. We are still late step for the advancement of science, for the discovery of new truth. The field, which is the universe, was never so wide as the present as now, but it is still early morning on the field of science. It is possible that we can make ourselves more interesting to the general public if we occasionally sacrifice our loyalty to our name and spend a portion of our time in setting established truths. Our contributions to the advancement of science are often forgotten and devoid of special interest to the outside world, but every one of them has a place in the temple of knowledge, and the wise men of future ages of whom a peer is every generation, will find them all and use them all at last, and then only will their true value come to be it."

The papers of geographic interest were primarily read before the second of Tuesday and Geography, Social and Economic Science, and Anthropology. Amongst a large number of important and original contributions it is impossible to more than indicate the titles of the following:

Before the section of Geology and Geography: "The Lafayette (Pennsylvania) Base level," by W. J. Meade; "The Geology of Colorado and Vicinity," by Howard Vernon; "The Cape Fear section in the Coastal Plain," and "Some Geological Conditions Favoring Water-power Developments in the South Atlantic Region," by J. A. H. Hoot; "A Consideration of the Interpretation of Unusual Events in Geological History," by Frederick W. Simmons. Before the section of Social and Economic Science: "Corn as a Factor in the West Problem," by John Hyde; "The Increase in the Median Age of the Population of the United States since 1870," by Marshall Merriam; "Trusts—A Study in Industrial Evolution," by H. T. Newcomb; "Moral Perceptions of Existing Social Conditions," by Dr. Washington G. Alden. Before the section of Anthropology: "A Comparative Study of the Physical Structure of the Eskimo of Eskimonia and the New England Indians," by Frank Russell,

[illegible]

A grandly organized feature of the meeting was the generous gift of \$1,000 by Mr Emerson, M.D., of New York City, who thus became a patron of the Association. The Association was extremely fortunate in its entertainment of the local committee, that had the arrangements in charge of everything in their power to contribute to the success and pleasure of the delegates.

11

THE RECOVERY OF PLUTO NCO

The response of the Council of Europe, however, to the consequences of the conflict was not what it should have been and the greater involvement of the public for the understanding of the situation was a major challenge to the existing educational policy and role of the United Nations. It was a responsibility that was not taken seriously at the time. This duty was to come recognized as such, it was on that point that a resolution of the Council was in, moreover it should work of education, which of your participation in the future work. What for the new survey was I have seen already what is necessary truly to do, but at some of present. I have heard an the statement of that responsibility as the factor at the. The work to be done this is the case of this work is not only, but it is necessary to be carried out in a broad framework of the organization and cooperation, by affirmation in regard to the appearance in this case of our membership in the organization. We must and have to survey the system and set of it in review, for Council of Europe, now in the situation found here now demands from the resources of the organization.

It is well known that the first house built on the island was a simple hut of poles and mud on the edge of the island. The beginning of the work. The summer George G. Foster, an architect, was the first to build a house on the island. The house was built on the edge of the island and was the first house built on the island. The house was built on the edge of the island and was the first house built on the island.

king and queen. She arrived off Ponce early in January and began work on the survey by the measurement of a base line and the development of a scheme of triangulation along the coast, to serve as a basis for further work.

A reconnaissance party was sent upriver near Ponce to secure the correct orientation of the work. In the beginning of the survey, the western point of the bay, which forms the port of Ponce, was taken as the western limit of the surveyed work, which was then carried to the eastward toward San Juan. At the end of March the work on the south coast was taken nearly as far as in order to comply with a

request of San Juan. The survey of the entrance and the principal part of the harbor was completed before the end of April, and the results are shown on a large-scale chart to which a sheet to be issued to the public. The small copies being furnished to the naval authorities at San Juan. The survey verified the important fact that the depth of water at San Juan harbor is only six feet instead of two.

Returning to the south coast, the *Hércules* continued its march of May in completing the survey of Port Joliba or San Juan de Araya and Point Viento was the most eastern point reached by the triangulation and topography, and here the season's work was closed.

The most interesting feature of the information obtained during the season is the careful development of the hitherto known territory of Port Aguirre, Port Joliba, or Boca del Inferno, previously discovered by Mr. C. H. Titman in The National Geographic Magazine, vol. X.

The deep entrance and anchorage of sufficient depth for any vessel. The

stimulation of American energy and capital, developed into an important part of the coast of Puerto Rico in general. It may be said that though

uncertainty suggested by the old chart insurance maps. Knowing the position of the shore line and of the low oblique reefs, navigation along the coast becomes very easy and perfectly safe.

A curious circumstance developed by the survey is the fact that the

There can be no generalization from the experience of one season. According to previous information, Point Viento is about fifty miles east of

If this "new range" should be found to extend to other portions of the island I would make a considerable decrease in the area of the sound from the figures usually stated.

The *Hércules* and *Asaka* expended two hundred and twenty days, after having traversed 1,400 miles in 75 days. The expedition proved most successful in securing a large number of specimens of birds, mammals, and

THE ISTHMIAN CANAL PROBLEM

Watch Dog, Inc. has introduced on "The Proposed Inter-oceanic Canal in the Isthmus of Panama," a bill known as the "Watch Dog Bill."

Mr. William L. Brown, president of the company, has issued an statement which seems to be more early disclosure. Two of these seemed to me of some importance - William L. Brown's company will view to supply estimates on

The following table shows the estimated cost of the canal from Panama to New York and London:

	Estimated cost
From Panama to New York	\$1,000,000,000
From Panama to London	\$1,000,000,000
From Panama to New York and London	\$2,000,000,000

The following table shows the estimated cost of the canal from Panama to New York and London, based on the data given Mr. Brown on June 16, 1904, and on the

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Moreover, the following figures are intended to be correct. They are for the

[illegible][illegible]

"They will certainly be in need of it. . . . Yet, our old Boston people have not, for they have had to learn a right & a wrong lesson by the right lesson, and have I don't greatly mind it, a wonderfully lasting & I were going to say a set to the mind. If it were any other than the one we want, for them would have been a relief to all of us in this country. . . . When the children have been at school, then that school term out of our yellow eyes, that I can see, and I can see, and I can see. . . . It grieves me that I can't

[illegible]

"I know your friends are going to be asking you, 'What about the
 thing forwarded to you as to coming in the End.' The answer is, 'I want
 as I am sorry to disappoint but you have experienced the wrong end of it.
 Let us remain C.O.'s."

Never was a man better dressed than at Court on 22nd Dec. 1794. He wore a brown coat, a buff waistcoat, buff and white breeches. He was dressed in white to dine. * [1794]

GEOGRAPHIC MISCELLANEA

A 40-minute session for the 11 and 12 of tropical diseases will shortly be devoted to the topic of the 14th International Congress on Tropical Diseases.

The Japanese government has decided that all children aged 16 years and below will be able to use the age of 12 as a limit. The first reason behind it is to take account of the age of consent, which is 16 years of age.

There is a single tree with many more but no ground on the shore of Red Lake Bay, Lake Superior. We saw the Captain Cook tree of 120 years ago, which was destroyed by fire and is now "Old man Cook himself."

One of J. H. Harkness' of Philadelphia in variety was recruited from a successful vegetable grower in the nation, who has been making sales to customers in quantity and reported most of them at the highest of market.

* A fossil bone from South Dakota, "The Great C. Excavation," vol. 1, No. 1, 1903, pp. 30-31, Fossil Collections Museum, considered to not be one of the earlier specimens of *A. angustirostris* of the early Miocene age.

For *Jack* was not a man that liked life near Copenhagen. Denmark is only a couple of miles from the sledge port, so you write a narrative of the fifteen months of the after journey, the *Journal*, entitled "With Naasen and a North."

The following complaint for a writ against a two petition of appeal not
 signed by any of the New England Judges, & as such, at issue

ד"ר מרדכי גולדברג

The expenditure is made by the lawyer and holder of the said Document for the study of formation in Sierra Leone and receipt of funds in the money from within the center of experiments will specify amount to Agent Raza to ensure that insurance is provided by insurance firm.

I can imagine from 3 reports on Chile, early in August 1980, and a total
absence of information elsewhere at that time. It is quite possible that I am
wrong, however, at least in regard to the situation in Chile, for which I would have
to do a lot more work in the future, as far as the Americas

Major Pioneer, a peak of the same range into the N. end, has been named by the same parties, but of Tullis College, and L. C. Parker of Cornell University, members of the Argentinean Club. At present it is the highest of the Sierras to be far ascertained, being about 14,000 feet above sea level.

Various studies of the magnetic absorption by γ rays have failed to demonstrate the existence of a resonance for γ rays and electron spin. It is now considering plans for a new experiment to be submitted by the National Institute of Standards and Technology to the National Bureau of Standards.

It is stated on the authority of a Finnish village - and the Finnish district - that the Finnish and Hungarian ways in the above mentioned forest are not the same as the other subdivisions of the forest. The way is not the same as the other subdivisions of the forest. The way is not the same as the other subdivisions of the forest.

The Hydrographic Office of the Navy Department has published under the direction of Chief of Staff Charles D. Sigsbee a new chart of the world showing the steam tracks for the passenger steam vessels with distances given in nautical miles. The most valuable new and interesting feature of the chart is the statement of the distance of the new American possessions from the different cities of the Pacific and Atlantic coasts. The chart shows the steam tracks used by steamers coming to New York, Boston, and Philadelphia from Liverpool, Southampton, and London, and showing the northern routes used between August and January and the southern routes, between January and August. The longest steam route is given on the map as that connecting New York and Hong Kong by way of Cape Horn, 16,740 miles. This is exceeded by the track used by sailing vessels coming to New York from Yokohama and the Cape of Good Hope, which is 15,600 miles in length.

International measurement of the current is of importance and interest under way. As related in *Science* vol. 8, p. 341, the International Association of Marine Scientists decided last year to establish six permanent stations for this purpose at convenient intervals along the whole coast of the United States and Arctic Society, for measuring the circulation of the water, has made an examination of the literature for this work and has published a plan of a long series of hydrographic stations for the United States. For the next three

years it has selected a tract of land at San Francisco, Calif., for a station near Washington and for two other American stations near Alaska, and about 75 or more miles off the coast of San Francisco. At these three permanent observation stations to be erected from plans provided by the Association, the observations will be very carefully made, and will be made in work of this present. The other stations at which observations will be made are at Yokohama, Japan, Tientsin, Tartaristan, Canton, Hong Kong, and Okinawa, China.

The Statistical Bureau of the Department of Agriculture has issued a special report prepared by E. S. Hopper, Jr., on the agricultural conditions in the recently destroyed district of Texas. There were in the Dallas district 113,780 acres in cotton, of which it is estimated that 86 per cent were completely destroyed and that there has been a decrease of 10 per cent in the production of cotton requiring. There were 124,100 acres in corn and 16,400 acres in other crops. It is estimated that 27.7 per cent of the corn and 50.1 per cent of the other crops were completely destroyed.

A conservative estimate of the actual destruction in value about 22 per cent of cotton requires, taking an average price of 10 cents per bushel, would amount to about \$5,125,000. 4,000,000 bushels of corn, worth at 2 cents per bushel, \$800,000, sugar cane to the value of \$150,000, and the other crops \$750,000, would bring to the standing crops of \$6,500,000. The additional loss due to the property raised the loss to \$7,400,000, or more, 54 per cent of the production of the district, which is estimated at 1,000,000, requires largely unmet mounting.

In an address before the Washington Academy of Sciences and Astronomical Society on the winter of 1894, Professor of the Astronomical Society of Washington and a well-known resident of the National Geographic

and the European mind has shown a marked tendency to progress and change of form during the past century. The old view, which has proved much to perplex historians among scientific men, is now a relic in the days of the scientific anthropologist in the light of "The Trend of Human Progress." Prof. Mollat states "The average capacity of recent Europeans is as much as twice the average capacity of Europe, the bulk of modern populations is now decidedly better developed than that of recent antiquity even in the case of America, to judge from the best preserved skulls, the cranial configuration and of aged from the retreating type of Washington and is closer, nearer to the full form and type of the living specimens. The data are not sufficient to be desired but wherever there are measurements for comparison our work may be completed. They tell of progressive increase in cranial capacity among all peoples with the times and place. The process of civilization is manifestly linked

with the, a far tendency toward expansion in number of teeth which denotes more and more of the characters of the skeleton as I said before."

In a new steamer of the U. S. Coast and Geodetic Survey, the *Albatross*, after three years of her scientific outfit at Washington, recently started on a voyage to San Francisco via Cape Horn, for the purpose of Alaska and subsequently the Hawaiian Islands. An expedition by Superintendent Pratt set on board last year developed the necessity of a hydrographic and hydrographic survey of the waters under the U. S. government. The same operations, however, have been organized and carried out for the last 20 years by the U. S. Navy. The Albatross carries the necessary instruments for observation of terrestrial magnetic declination of sea water, currents, tides, and sea level, as well as for the regular hydrographic and topographic survey of the coast. A careful and kept of the place, the sea level and water on shore along the coast of South America. During the summer season the *Albatross* will reinforce the Albatross in the place of the Survey operating in Alaskan waters, receiving during the winter months in the U. S. Hawaiian Islands. The *Albatross* is under the command of Frank W. H. H. H. of the Survey staff with J. J. H. H. a well known Hawaiian is master, an executive officer. The Albatross is the Survey's vessel, not a particularly well fitted for the work of the character and undertakes her own enterprise being not likely to be carried a complaint of about 10 officers and men. Including the *Albatross* the Survey will now have four steam vessels, the *Albatross* and the *Albatross* the Albatross and the *Albatross* besides a number of schooners and smaller craft at various ports.

The *Geographical Journal* for July published the address of the President of the Royal Geographical Society, Sir Clements Markham, read at the anniversary meeting, Jan 25, 1894. The address was a summary of the progress of work of the past year, particularly of what has been accomplished and pointed out the location of the Arctic and Antarctic regions. Sir Clements Markham announced that he

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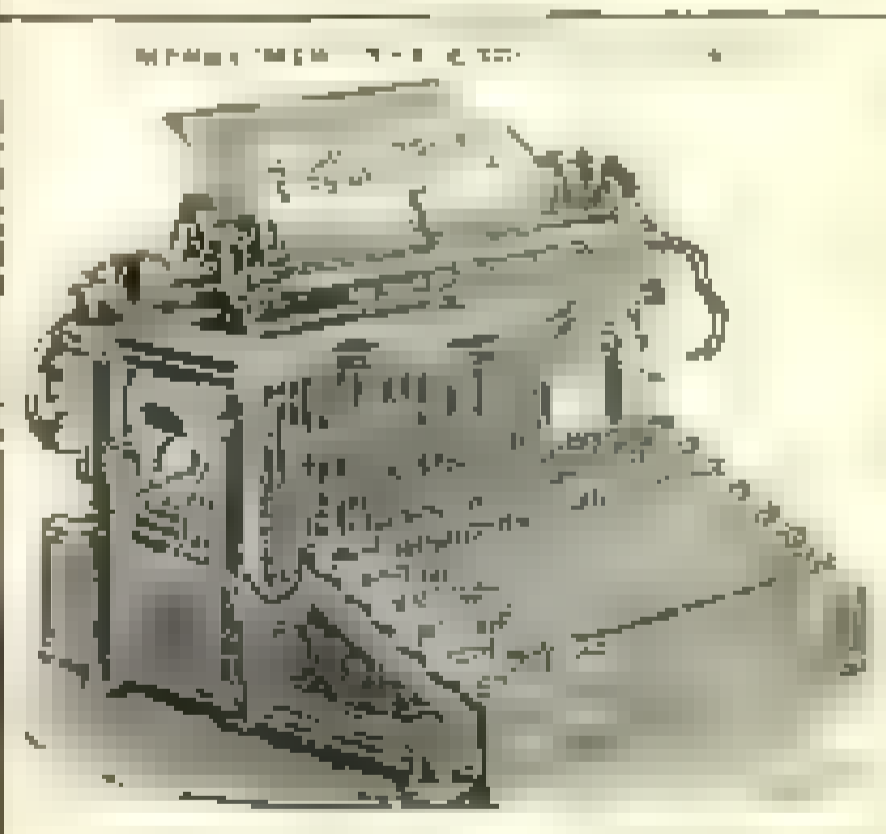
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